

WHAT IS CLAIMED IS:

1. A method for managing power in a computer system, comprising:
checking whether a prescribed device is in use;
identifying a power management state of a CPU; and
forcing the power management state of the CPU to enter a prescribed power saving state when the prescribed device is in use according to the identified power management state.
2. The method of claim 1, wherein the prescribed device is an audio device or a USB device.
3. The method of claim 2, wherein a filter driver has a packet monitoring function for said checking whether the prescribed device is in use.
4. The method of claim 3, wherein the filter driver detects an IRP (In/Out Request Packet) outputted from the prescribed device to check whether the prescribed device is in use.
5. The method of claim 4, wherein said forcing the power management state of the CPU to enter the prescribed power saving state includes the filter driver forcing the power management state of the CPU to enter the C3 or C4 state as the prescribed power saving state when the power management state of the CPU is a C1 or C2 state, wherein the power states are determined in an ACPI (Advanced Configuration and Power Interface)

standard, and wherein the filter driver directly transitions the power management state of the CPU independently of an operating system.

6. The method of claim 1, wherein the power management state remains unchanged when the prescribed device is not in use.

7. The method of claim 1, wherein the prescribed power saving state is a C3 or C4 state defined in an ACPI (Advanced Configuration and Power Interface) standard.

8. The method of claim 7, wherein said forcing the power management state of the CPU to enter the prescribed power saving state includes forcing the power management state of the CPU to enter the C3 or C4 state as the prescribed power saving state if the power management state of the CPU is a C1 or C2 state defined in the ACPI standard.

9. The method of claim 7, wherein said forcing the power management state of the CPU to enter the prescribed power saving state includes maintaining the power management state of the CPU unchanged if the ACPI standard power management state of the CPU is a C0 state or the C3 or C4 state.

10. The method of claim 1, wherein said forcing the power management state of the CPU to enter the prescribed power saving state comprises:

establishing a prescribed delay interval of time;

re-checking whether the power management state has entered the prescribed power saving state after the prescribed delay interval has passed; and

forcing the power management state of the CPU to enter the prescribed power saving state when the re-checked power management state is not the prescribed power saving state.

11. The method of claim 1, wherein said forcing the power management state of the CPU to enter the prescribed power saving state comprises:

initializing a countdown value;

re-checking whether the power management state has entered the prescribed power saving state; and

reducing the countdown value by one and repeating said re-checking unless the power management state is the prescribed power saving state until the countdown value is zero; and

forcing the power management state of the CPU to enter the prescribed power saving state when countdown value is zero and the re-checked power management state is not the prescribed power saving state.

12. An article including a machine-readable storage medium containing instructions for managing power in a computer system including therein a filter driver having a monitoring function, said instructions, when executed in the computer system, causing the filter driver to:

check whether a specific device is in use;

check a power management state of a CPU; and

force the power management state of the CPU to enter a specific power saving state, when the specific device is in use according to a result of the check on the power management state of the CPU.

13. The article of claim 12, wherein the specific device is an audio device or a USB device.

14. The article of claim 12, wherein the storage medium contains instructions for causing the filter driver to detect an IRP outputted from the specific device to check whether the specific device is in use.

15. The article of claim 12, wherein the storage medium contains instructions for causing the filter driver to maintain the power management state of the CPU unchanged when the specific device is not in use.

16. The article of claim 12, wherein the specific power saving state is a C3 or C4 state defined in an ACPI (Advanced Configuration and Power Interface) standard.

17. The article of claim 16, wherein the storage medium contains instructions for causing the filter driver to force the power management state of the CPU to enter the C3 or C4 state as the specific power saving state when the power management state of the CPU is a C1 or C2 state defined in the ACPI standard.

18. The article of claim 16, wherein the storage medium contains instructions for causing the filter driver to maintain the power management state of the CPU unchanged if the power management state of the CPU is a C0 state or the C3 or C4 state.

19. The article of claim 12, wherein said instructions causing the filter driver to force the power management state of the CPU to enter the specific power saving state comprise instructions to:

establish a prescribed delay interval of time;

re-check whether the power management state has entered the specific power saving state after the prescribed delay interval has passed; and

force the power management state of the CPU to enter the specific power saving state when the re-checked power management state is not the specific power saving state.

20. The article of claim 12, wherein said instructions causing the filter driver to force the power management state of the CPU to enter the specific power saving state comprise instructions to:

initialize a countdown value;

re-check whether the power management state has entered the specific power saving state; and

reduce the countdown value by one and repeat said re-check until the countdown value is zero unless the power management state is the specific power saving state; and

force the power management state of the CPU to enter the specific power saving state when countdown value is zero and the re-checked power management state is not the specific power saving state.

21. A computer system, comprising:

a CPU;

an operating system configured to set a power management state of the CPU in the computer system while dividing the power management state into a multi-step operating state and power saving state;

at least one prescribed device; and

a filter driver configured to transition the power management state of the CPU to a prescribed power saving state according to a current power management state and a status of the prescribed device.

22. The computer system of claim 21, wherein the prescribed device is an audio device or a USB device.

23. The computer system of claim 21, wherein the filter driver detects an IRP of the prescribed device to check whether the status of the prescribed device is in use.

24. The computer system of claim 21, wherein the filter driver maintains the current power management state of the CPU unchanged when the status of the prescribed device is not in use, and wherein the filter driver maintains the current power management state when the CPU is in a C0 state or the C3 or C4 state defined in an ACPI standard.

25. The computer system of claim 21, wherein the prescribed power saving state is a C3 or C4 state defined in an ACPI (Advanced Configuration and Power Interface) standard.

26. The computer system of claim 25, wherein the filter driver forces the current power management state of the CPU to be set to the prescribed power saving state when the status of the prescribed device is checked to be in use and the CPU is in a C1 or C2 state defined in the ACPI standard.

27. The computer system of claim 26, wherein the filter driver directly transitions the current power management state of the CPU independent of the operating system.

28. The computer system of claim 21, comprising a timer that is configured to establish a prescribed delay interval of time, wherein the filter driver re-checks whether the power management state has entered the prescribed power saving state after the prescribed delay interval has passed, and wherein the filter driver forces the transition of the power management state of the CPU to the prescribed power saving state when the re-checked power management state is not the prescribed power saving state.

29. The computer system of claim 21, comprising a countdown circuit configured to countdown from a countdown value to zero, wherein the power management state is repeatedly re-checked for each value of the countdown circuit from

the countdown value to zero unless the power management state is the prescribed power saving state, and wherein the filter driver forces the transition of the power management state of the CPU to the prescribed power saving state when countdown value is zero and the re-checked power management state is not the prescribed power saving state.

30. A device for managing power in a computer system that includes a CPU, and one of an audio device and a USB device, wherein the CPU has a multi-step operating and power saving state, said device comprising;

an operating system configured to set a power management state of the CPU; and

a filter driver configured to force the power management state of the CPU to be set from a C1 or C2 state defined in the ACPI standard to a C3 or C4 state defined in an ACPI standard when said one of an audio device and a USB device is in use.

31. The device of claim 30, wherein the filter driver directly forces the power management state of the CPU to be changed, independently of the operating system.

32. The device of claim 31, wherein the filter driver detects an IRP of said one of the audio device and the USB device to check whether said one of the audio device and the USB device is in use.

33. The device of claim 31, wherein the filter driver maintains the power management state of the CPU unchanged when said one of the audio device and the USB

device is not in use, and wherein the filter driver maintains the power management state of the CPU unchanged, if the CPU is in a C0 state or the C3 or C4 state.